

Abstract Submitted
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Highly Efficient Production of an Absolute Ground State Dipolar Molecular Bose-Einstein Condensate PIERRE PHOU, MATTHEW MACKIE, Temple University — We model formation of dipolar molecular condensate via Raman photoassociation of a two-component BEC, focusing on one- and two-step Landau-Zener sweeps of the laser detuning. In a one-step scheme, atoms are converted directly to absolute ground state molecules. In a two-step scheme, an initial sweep converts atoms to ground-electronic molecules in a high-lying vibrational state, and a second sweep converts the vibrationally-excited molecules into absolute ground state molecules. Realistic complications include rogue dissociation, spontaneous decay, elastic and inelastic collisions. The one-step scheme allows for high densities and more molecules, but requires high laser intensity to simultaneously overcome spontaneous decay and elastic collisions. On the other hand, a two-step scheme allows for low intensity but produces fewer molecules, since inelastic collisions require low densities.

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